of CAS No, 10118-90-8, derived from tetracycline, or a pharmaceutically acceptable salt thereof. In some embodiments, minocycline is administered in the form of its hydrochloride $C_{23}H_{27}N_3O_7$.HCl of CAS No. 13614-98-7.

[0018] The term "minocycline" as used herein, is intended to include, but not limited to, minocycline and pharmaceutically acceptable salt thereof, pharmacologically active derivatives of minocycline, including both individual enantiomers of minocycline (dextrogyral and levogyral enantiomers) in their substantially pure form and their pharmaceutically acceptable salts, mixtures (in any ratio) of minocycline enantiomers and their pharmaceutically acceptable salts, and active metabolites of minocycline and their pharmaceutically acceptable salts.

[0019] The term "pharmaceutically acceptable salts" as used herein, includes salts which are suitable for use in contact with the tissues of humans without undue toxicity, irritation, allergic response and the like, which are well known in the art. Examples of pharmaceutically acceptable salts include, but are not limited to, any of the salts or co-crystals of minocycline selected from hydrochloride, hydrobromide, sulphate, citrate, phosphate, maleate, formate, acetate, nitrate, mesylate, succinate, benzoate and the like. The salts may be in the form of solvate, hydrate, hemihydrates, or anhydrous forms.

[0020] As used herein, the term "rifampin" relates to a naturally-occurring antibiotic, $C_{43}H_{58}N_4O_{12}$, of CAS No. 13292-46-1, produced by the soil bacterium *Amycolatopsis rifamycinica*, or a pharmaceutically acceptable salt thereof.

[0021] As used herein, the term "clindamycin", relates to a semi-synthetic antibiotic, $C_{18}H_{33}ClN_2O_5S$, of CAS No. 18323-44-9, derived from lincomycin, a natural antibiotic produced by the actinobacterium *Streptomyces lincolnensis*, or a pharmaceutically acceptable salt thereof. In some embodiments, clindamycin is administered in the form of its phosphate, $C_{18}H_{34}ClN_2O_8PS$, of CAS No. 24729-96-2 or hydrochloride, $C_{18}H_{34}Cl_2N_2O_5S$ of CAS No. 21462-39-5 or Hydrochloride Monohydrate of CAS Number 58207-19-5.

[0022] Aspects and embodiments of the invention are described in the specification hereinbelow and in the appended claims.

[0023] According to an aspect of some embodiments described herein, there is provided an antimicrobial composition comprising at least one degradation product of oxidized cellulose (OC), and an antibiotic being minocycline.

[0024] According to some embodiments, the OC comprises oxidized regenerated cellulose (ORC).

[0025] According to some embodiments, the antimicrobial composition is devoid of an additional antibiotic.

[0026] According to some embodiments, minocycline is present in the antimicrobial composition, together with the at least one OC degradation product, at a concentration of from about 12.5 ng/ml, such as from about 12.6 ng/ml, about 13.0 ng/ml, about 13.5 ng/ml, about 14.0 ng/ml, about 14.5 ng/mi, about 15.0 ng/ml, about 15.5 ng/axil, about 16.0 ng/ml, about 16.5 ng/ml, about 17.0 ng/ml, about 17.5 ng/ml, about 18.0 ng/ml, about 18.5 ng/ml, about 19.0 ng/ml, about 19.5 ng/ml, about 20.0 ng/ml, about 20.5 ng/ml, about 21.0 ng/ml, about 21.5 ng/ml, about 22.0 ng/ml, about 22.5 ng/ml, about 23.0 ng/ml, about 23.5 ng/ml, about 24.0 ng/ml, about 24.5 ng/ml, or about 25.0 ng/ml, including any value and range therebetween.

[0027] According to some embodiments, minocycline is present in the antimicrobial composition, together with the at least one OC degradation product, at a concentration of at least about 12.6 ng/ml.

[0028] According to some embodiments, minocycline is present in the antimicrobial composition, together with the at least degradation product of OC, at a concentration of up to about 25 ng/ml, such as up to about 12.6 ng/ml, about 13.0 ng/ml, about 13.5 ng/ml, about 14.0 ng/ml, about 14.5 ng/ml, about 15.0 about 15.5 about 16.0 ng/ml, about 16.5 ng/aril, about 17.0 ng/ml, about 17.5 ng/ml, about 18.0 ng/ml, about 18.5 ng/ml, about 19.0 ng/ml, about 19.5 ng/ml, about 20.0 ng/ml, about 20.5 about 21.0 ng/ml, about 21.5 ng/ml, about 22.0 ng/ml, about 22.5 ng/ml, about 23.0 ng/ml, about 23.5 ng/ml, about 24.0 ng/ml, about 24.5 ng/ml, or about 25.0 ng/axil, including any value and range therebetween.

[0029] According to some embodiments, minocycline is present in the antimicrobial composition at a concentration which is from about 2 to about 20 times lower than the MIC achieved in the absence of at least one degradation product of OC, i.e. minocycline is from about 2 times to about 20 times more effective in the presence of the degradation product of OC, for example, about 2 times, about 3 times, about 4 times, about 5 times, about 6 times, about 7 times, about 8 times, about 9 times, about 10 times, about 11 times, about 12 times, about 13 times, about 14 times, about 15 times, about 16 times, about 17 times, about 18 times, about 19 times or about 20 times more effective.

[0030] MIC relates herein to the lowest concentration of a chemical which prevents bacterial growth in a solution when the growth is monitored at an OD range of 595-600 nm e.g. as described in the "Examples" section. A MIC depends on the microorganism, the affected human being (in vivo only), and the antibiotic.

[0031] For example, the MIC of a chemical is determined by preparing solutions of the chemical in vitro at increasing concentrations, incubating the solutions with the separate batches of cultured bacteria, and monitoring the bacterial growth throughout time at the OD range of 595-600 nm. In order to define the MIC of a certain chemical the Effective Time 50 (ET50) is determined i.e. the time, in minutes, required for the antibiotic to induce a response halfway between the baseline and maximum OD reading at the range of 595-600 nm. The maximum OD is determined by bacterial growth in MHBII without the chemical. The first chemical concentration where the ET50 reached about ≥1650 minutes was determined as the MIC.

[0032] It has further been found that the synergistic effect of at least one degradation product of an OC and minocycline is not reduced upon addition of an additional antibiotic such as rifampin, clindamycin, or a mixture thereof, and in fact, the antimicrobial effect which occurs upon inclusion of such additional antibiotics in the compound was found to increase.

[0033] In some embodiments, the OC comprises ORC. Hence, according to some embodiments, the antimicrobial composition further comprises at least one additional antibiotic, such as, for example, rifampin, clindamycin or a combination thereof.

[0034] In some embodiments, the antimicrobial composition comprises at least one degradation product of ORC, minocycline and rifampin. In some embodiments, the antimicrobial composition comprises at least one degradation